

State/Industry Ambient Monitoring Network

Air Quality Report

4th Quarter 2003

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SECTION ONE

DISCUSSION OF MONITORING RESULTS

Sulfur Dioxide (SO₂)

There were no exceedances of the state or federal standards during the quarter. The maximum 1-hour concentration was 157 ppb on December 21 at Mandan - SPM; the maximum 3-hour concentration was 120 ppb on December 21 at Mandan - SPM; and, the maximum 24-hour concentration was 42 ppb on December 15 at Mandan - SPM. All sites achieved at least an 80% data recovery for the period.

A new site, Lostwood NWR, was add to the network effective October 27.

Sulfur Dioxide (SO₂) 5-Minute Average

The maximum 5-minute concentration was 366 ppb on December 21 at Mandan - SPM.

A new site, Lostwood NWR, was add to the network effective October 27.

Ozone (O₃)

There was no exceedance of the ozone standard during the quarter. The maximum observed 1-hour concentration was 57 ppb on October 7 at Fargo NW and TRNP - SU (Painted Canyon) on October 5. The highest 4th highest 8-hour concentration was 48 ppb on October 5 at Fargo NW.

A new site, Lostwood NWR, was add to the network effective October 27.

Nitrogen Dioxide (NO₂)

The maximum 1-hour concentration observed was 48 ppb on October 6 at Fargo NW. All sites achieved at least an 80% data recovery for the period operated.

A new site, Lostwood NWR, was add to the network effective October 27.

Ammonia (NH₃)

The maximum 1-hour concentration was 155.6 ppb on October 5 at Beulah North . The site achieved at 80% data recovery for the period.

The data is used as part of the ambient data input used by the newer dispersion models.

Inhalable Continuous PM_{2.5} Particulates

The maximum 1-hour concentration was 39.6 µg/m³ on October 23 at Fargo NW. The maximum 24-hour concentration was 13.7 µg/m³ on October 9 at Fargo NW. All sites achieved at least an 80% data recovery for the period..

A new site, Lostwood NWR was add to the network effective October 27.

Inhalable FRM PM_{2.5} Particulates

The maximum 24-hour average concentration was 24.8 µg/m³ on December 14 at Fargo NW. All sites achieved at least an 80% data recovery for the period.

Inhalable Continuous PM₁₀ Particulates

The maximum 1-hour concentration was 34.3 µg/m³ on December 1 at Lostwood NWR. The maximum 24-hour concentration was 13.9 µg/m³ on November 27 at Lostwood NWR. . The site achieved at 80% data recovery for the period.

A new site, Lostwood NWR was add to the network effective October 27.

Inhalable PM₁₀ Particulates

There was no exceedance of the 24-hour standard during the quarter. The maximum 24-hour average concentration was 60 µg/m³ on October 6 at Fargo NW. All sites achieved at least an 80% data recovery for the period.

SECTION TWO

AMBIENT AIR QUALITY DATA

SUMMARIES

COMPARISON OF AIR QUALITY DATA WITH
THE NORTH DAKOTA AMBIENT AIR QUALITY STANDARDS *

POLLUTANT : Sulfur Dioxide (ppb)

LOCATION	YEAR	SAMPLING PERIOD	NUM OBS	1 - HOUR		M A X I M A		24 - HOUR		ARITH MEAN	1HR #>273	24HR #>99	% >MDV
				1ST MM/DD:HH	2ND MM/DD:HH	1ST MM/DD:HH	2ND MM/DD:HH	1ST MM/DD	2ND MM/DD				
Amerada Hess - Tioga #1	2003	OCT-DEC	2185	33 11/28:22	30 11/24:19	24 11/28:23	23 11/01:11	6 11/01	5 11/28	1.7			15.5
Amerada Hess - Tioga #3	2003	OCT-DEC	2184	56 10/27:21	56 12/17:13	43 10/27:23	38 12/15:05	22 12/15	15 10/28	2.7			20.2
Bear Paw - MGP #3	2003	OCT-DEC	2183	16 11/03:03	13 11/03:05	14 11/03:05	6 11/03:08	6 11/03	3 12/15	1.2			6.4
Bear Paw - MGP #5	2003	OCT-DEC	2180	15 11/03:03	12 11/03:02	12 11/03:05	5 11/03:11	5 11/03	2 12/15	1.1			6.3
Beulah - North	2003	OCT-DEC	2195	31 12/30:06	27 12/30:05	17 12/30:08	13 10/01:17	5 12/30	5 10/01	1.5			17.6
DGC #12	2003	OCT-DEC	2194	33 10/03:09	29 11/03:08	14 10/20:11	14 11/03:08	6 10/20	5 11/03	1.7			20.6
DGC #14	2003	OCT-DEC	2196	44 10/06:12	34 10/04:10	21 10/04:11	20 10/06:14	6 10/06	5 10/01	1.6			16.8
DGC #16	2003	OCT-DEC	2197	59 10/01:12	54 10/01:13	47 10/01:14	27 12/30:05	11 10/01	8 12/30	1.5			13.1
DGC #17	2003	OCT-DEC	2195	40 12/30:05	30 12/30:06	28 12/30:05	20 12/30:08	9 12/30	5 10/01	1.4			11.5
Dunn Center	2003	OCT-DEC	2185	15 11/03:11	14 11/03:05	12 11/03:11	10 11/03:08	5 11/03	4 12/30	1.3			18.9
Fargo NW	2003	OCT-DEC	2193	15 11/27:22	7 11/27:23	9 11/27:23	3 12/02:20	2 11/27	2 12/02	1.1			3.2
Hannover	2003	OCT-DEC	2192	39 11/21:16	35 11/21:15	31 11/21:17	19 12/30:02	7 11/21	6 11/14	1.7			23.3
Lostwood NWR	2003	OCT-DEC	1544	35 12/08:13	29 12/08:11	28 12/08:14	25 12/08:11	15 12/08	5 12/15	2.1			26.6
Mandan - SPM	2003	OCT-DEC	2196	157 12/21:11	126 12/04:17	120 12/21:11	85 10/28:02	42 12/15	39 10/28	6.2			46.9

COMPARISON OF AIR QUALITY DATA WITH
THE NORTH DAKOTA AMBIENT AIR QUALITY STANDARDS *

POLLUTANT : SULFUR DIOXIDE (ppb)

LOCATION	YEAR	SAMPLING PERIOD	NUM OBS	1 - HOUR		M A X I M A		24 - HOUR		ARITH MEAN	1HR #>273	24HR #>99	% >MDV
				1ST	2ND	1ST	2ND	1ST	2ND				
				MM/DD:HH	MM/DD:HH	MM/DD:HH	MM/DD:HH	MM/DD	MM/DD				
Mandan NW - SPM	2003	OCT-DEC	2195	60 12/01:23	60 12/24:21	46 12/24:23	30 12/25:02	11 12/24	9 10/29	2.9			41.5
TRNP - NU	2003	OCT-DEC	2194	27 10/02:00	23 10/01:23	17 10/02:02	10 10/01:23	5 11/03	4 10/02	1.3			12.0
TRNP - SU (Painted Canyon)	2003	OCT-DEC	2194	5 10/04:02	5 10/10:02	3 10/10:02	3 12/30:08	2 11/21	2 11/16	1.2			15.2

The maximum 1-hour concentration is 157 ppb at Mandan - SPM on 12/21:11
The maximum 3-hour concentration is 120 ppb at Mandan - SPM on 12/21:11
The maximum 24-hour concentration is 42 ppb at Mandan - SPM on 12/15

* The air quality standards are:

STATE Standards -

- 1) 273 ppb maximum 1-hour average concentration.
- 2) 99 ppb maximum 24-hour average concentration.
- 3) 23 ppb maximum annual arithmetic mean concentration.

FEDERAL Standards -

- 1) 500 ppb maximum 3-hour concentration not to be exceeded more than once per year.
- 2) 140 ppb maximum 24-hour concentration not to be exceeded more than once per year.
- 3) 30 ppb annual arithmetic mean.

COMPARISON OF AIR QUALITY DATA WITH
THE NORTH DAKOTA AMBIENT AIR QUALITY STANDARDS *

POLLUTANT : Sulfur Dioxide 5-Minute Averages (ppb)

LOCATION	YEAR	SAMPLING PERIOD	NUM OBS	5 - M I N U T E M A X I M A						# HOURS >600	% >MDV
				1ST	DATE	2ND	DATE	3RD	DATE		
					MM/DD:HH		MM/DD:HH		MM/DD:HH		
Amerada Hess - Tioga #1	2003	OCT-DEC	2185	120	11/24:19	90	12/25:06	82	11/18:17	0	23.2
Amerada Hess - Tioga #3	2003	OCT-DEC	2184	96	12/08:07	94	10/28:02	92	10/28:01	0	36.3
Bear Paw - MGP #3	2003	OCT-DEC	2183	59	12/17:20	43	12/17:21	28	11/03:03	0	13.4
Bear Paw - MGP #5	2003	OCT-DEC	2180	24	11/03:03	19	11/03:02	17	10/03:08	0	12.0
Beulah - North	2003	OCT-DEC	2195	49	10/05:11	41	10/01:18	40	11/07:14	0	29.2
Dunn Center	2003	OCT-DEC	2185	26	11/03:05	23	11/03:06	21	11/03:10	0	31.8
Fargo NW	2003	OCT-DEC	2194	16	11/27:22	14	12/31:15	14	12/31:18	0	6.7
Hannover	2003	OCT-DEC	2192	82	11/21:15	68	12/07:11	63	11/21:16	0	38.3
Lostwood NWR	2003	OCT-DEC	1544	61	12/08:20	60	12/07:14	59	12/08:13	0	35.4
Mandan - SPM	2003	OCT-DEC	2196	366	12/21:11	244	12/21:09	214	12/21:12	0	62.3
Mandan NW - SPM	2003	OCT-DEC	2195	194	12/01:23	141	12/24:21	139	11/24:14	0	58.9
TRNP - NU	2003	OCT-DEC	2194	33	10/02:00	28	10/01:23	21	10/02:01	0	18.6
TRNP - SU (Painted Canyon)	2003	OCT-DEC	2194	14	10/05:04	13	10/04:02	13	10/05:22	0	29.5

The maximum 5-minute concentration is 366 ppb at Mandan - SPM on 12/21:11

* No Standard is currently in effect:

COMPARISON OF AIR QUALITY DATA WITH
THE NORTH DAKOTA AMBIENT AIR QUALITY STANDARDS *

POLLUTANT : Ozone (PPB)

LOCATION	YEAR	SAMPLING PERIOD	NUM OBS	M A X I M A		8 - HOUR		4TH	1HR #>120	8HR #>80	
				1 - HOUR	2ND	1ST	2ND				3RD
				1ST MM/DD	2ND MM/DD	1ST MM/DD	2ND MM/DD				3RD MM/DD
Beulah - North	2003	OCT-DEC	2193	55 10/05	54 10/05	49 10/05	46 10/05	46 10/05	44 10/05		
Dunn Center	2003	OCT-DEC	2192	56 10/07	54 10/07	52 10/07	47 10/07	46 10/07	45 10/07		
Fargo NW	2003	OCT-DEC	2192	57 10/07	56 10/09	47 10/07	47 10/07	45 10/08	41 10/08		
Hannover	2003	OCT-DEC	1786	49 10/07	48 10/05	46 10/06	45 10/06	43 10/07	41 10/06		
Lostwood NWR	2003	OCT-DEC	1544	42 11/09	41 11/06	40 11/09	39 11/09	39 11/09	39 11/09		
TRNP - NU	2003	OCT-DEC	2195	56 10/05	53 10/07	52 10/05	49 10/05	47 10/05	47 10/07		
TRNP - SU (Painted Canyon)	2003	OCT-DEC	2196	57 10/05	57 10/05	55 10/05	50 10/05	49 10/05	48 10/05		

The maximum 1-hour concentration is 57 ppb at Fargo NW on 10/07 and TRNP - SU (Painted Canyon) on 10/05
The 4th highest 8-hour concentration is 48 ppb at TRNP - SU (Painted Canyon) on 10/05

* The air quality standards for ozone are:

STATE - 120 ppb not to be exceeded more than once per year.

FEDERAL - Fourth highest daily maximum 8-hour averages for a 3-year period not to exceed 80 ppb.

COMPARISON OF AIR QUALITY DATA WITH
THE NORTH DAKOTA AMBIENT AIR QUALITY STANDARDS *

POLLUTANT : Nitrogen Dioxide (ppb)

LOCATION	YEAR	SAMPLING PERIOD	NUM OBS	M A X I M A 1 - HOUR		ARITH MEAN	% >MDV
				1ST MM/DD:HH	2ND MM/DD:HH		
Beulah - North	2003	OCT-DEC	2189	33 10/02:22	22 10/02:23	3.1	97.1
DGC #12	2003	OCT-DEC	2184	20 10/03:09	20 10/20:18	3.4	99.5
DGC #17	2003	OCT-DEC	2184	27 10/07:07	25 10/07:06	2.3	99.3
Dunn Center	2003	OCT-DEC	2023	9 12/30:08	9 12/30:10	1.8	89.1
Fargo NW	2003	OCT-DEC	2186	48 10/06:18	47 10/07:19	7.6	96.1
Hannover	2003	OCT-DEC	2184	24 10/05:17	22 12/30:02	2.3	93.8
Lostwood NWR	2003	OCT-DEC	1542	17 11/07:23	14 11/12:01	2.8	97.8
TRNP - NU	2003	OCT-DEC	2186	11 11/03:20	10 11/03:15	1.5	92.8

The maximum 1-hour concentration is 48 ppb at Fargo NW on 10/06:18

* The air quality standards are:
STATE - 53 ppb maximum annual arithmetic mean.
FEDERAL - 53 ppb annual arithmetic mean.

COMPARISON OF AIR QUALITY DATA WITH
THE NORTH DAKOTA AMBIENT AIR QUALITY STANDARDS *

POLLUTANT : Ammonia (ppb)

LOCATION	YEAR	SAMPLING PERIOD	NUM OBS	M A X I M A						1 - HOUR 5TH MM/DD:HH	6TH MM/DD:HH
				1ST MM/DD:HH	2ND MM/DD:HH	3RD MM/DD:HH	4TH MM/DD:HH	5TH MM/DD:HH	6TH MM/DD:HH		
Beulah - North	2003	OCT-DEC	2181	155.6 10/05:10	111.0 10/02:21	65.5 10/03:11	54.7 10/03:12	54.1 12/15:12	53.4 12/07:07		

* No standard is currently in effect.

COMPARISON OF AIR QUALITY DATA WITH
THE NORTH DAKOTA AMBIENT AIR QUALITY STANDARDS *

POLLUTANT : Inhalable Continuous PM_{2.5} (µg/m³)

LOCATION	YEAR	SAMPLING PERIOD	NUM OBS	M A X I M A						24 - HOUR 3RD MM/DD	4TH MM/DD	MEAN	1HR #>150	24HR #>65
				1ST MM/DD:HH	2ND MM/DD:HH	1ST MM/DD	2ND MM/DD	3RD MM/DD	4TH MM/DD					
Beulah - North	2003	OCT-DEC	2196	27.6 12/11:01	25.9 12/11:00	11.3 11/14	11.0 12/15	10.3 12/11	8.6 12/30			5.2		
Fargo NW	2003	OCT-DEC	2048	39.6 10/23:19	25.5 10/23:20	13.7 10/09	13.6 10/07	12.1 10/08	10.8 10/04			4.1		
Hannover	2003	OCT-DEC	2198	32.2 12/16:01	30.7 12/16:02	10.4 11/15	9.1 11/27	9.0 10/08	8.7 12/09			5.4		
Lostwood NWR	2003	OCT-DEC	1546	20.4 11/07:23	18.1 11/01:00	5.5 11/27	4.9 12/15	4.7 11/14	4.6 12/11			1.9		
TRNP - NU	2003	OCT-DEC	2201	23.1 12/03:08	21.8 10/06:16	9.0 11/03	8.7 10/07	8.6 11/06	8.4 11/27			5.0		
TRNP - SU (Painted Canyon)	2003	OCT-DEC	2196	20.6 10/07:08	20.2 10/06:09	11.4 10/07	10.3 10/06	9.0 10/04	8.9 12/27			5.0		

The maximum 1-hour concentration is 39.6 µg/m³ at Fargo NW on 10/23:19
The highest 24-hour concentration is 13.7 µg/m³ at Fargo NW on 10/09

* The ambient air quality standards are:

FEDERAL Standards -

- 1) 24-hour: 3-year average of 98th percentiles not to exceed 65 µg/m³.
- 2) Annual: 3-year average not to exceed 15 µg/m³.

COMPARISON OF AIR QUALITY DATA WITH
THE NORTH DAKOTA AMBIENT AIR QUALITY STANDARDS *

POLLUTANT : Inhalable FRM PM_{2.5} Particulates (µg/m³)

LOCATION	YEAR	SAMPLING PERIOD	NUM OBS	MIN	M A X I M A 24 - HOUR			ARITH MEAN	#> 65	AM>15	% >MDV
					1ST MM/DD	2ND MM/DD	3RD MM/DD				
Beulah - North	2003	OCT-DEC	15	2.0	13.2 12/11	10.9 12/29	7.8 11/05	5.5			100.0
Bismarck Residential	2003	OCT-DEC	30	1.5	15.5 12/26	10.7 12/17	10.6 11/08	6.0			96.7
Fargo NW	2003	OCT-DEC	30	1.0	24.8 12/14	18.4 12/08	18.3 11/17	8.9			96.7
TRNP - NU	2003	OCT-DEC	15	1.9	7.8 11/05	6.8 12/11	5.6 10/06	3.8			93.3
TRNP - SU (Painted Canyon)	2003	OCT-DEC	13	0.9	9.0 10/06	8.6 12/30	5.2 12/11	3.5			69.2

The maximum 24-hour concentration is 24.8 µg/m³ at Fargo NW on 12/14

* The ambient air quality standards are:

FEDERAL Standards -

- 1) 24-hour: 3-year average of 98th percentiles not to exceed 65 µg/m³.
- 2) Annual: 3-year average not to exceed 15 µg/m³.

COMPARISON OF AIR QUALITY DATA WITH
THE NORTH DAKOTA AMBIENT AIR QUALITY STANDARDS *

POLLUTANT : Inhalable Continuous PM₁₀ (µg/m³)

LOCATION	YEAR	SAMPLING PERIOD	NUM OBS	1 - HOUR		M A X I M A		24 - HOUR		MEAN	24HR #>150	AM>50
				1ST MM/DD:HH	2ND MM/DD:HH	1ST MM/DD	2ND MM/DD	3RD MM/DD	4TH MM/DD			
Lostwood NWR	2003	OCT-DEC	1535	34.3 12/01:16	33.2 12/10:16	13.9 11/27	12.6 12/02	11.4 11/06	11.3 12/10	7.3		

The highest 24-hour concentration is 13.9 µg/m³ at Lostwood NWR on 11/27
The highest Annual Mean concentration is 7.3 µg/m³ at Lostwood NWR

* The STATE and FEDERAL air quality standards are:

- 1) 150 µg/m³ maximum averaged over a 24-hour period with no more than one expected exceedance per year.
- 2) 50 g/m³ expected annual arithmetic mean.

COMPARISON OF AIR QUALITY DATA WITH
THE NORTH DAKOTA AMBIENT AIR QUALITY STANDARDS *

POLLUTANT : Inhalable PM₁₀ Particulates (µg/m³)

LOCATION	YEAR	SAMPLING PERIOD	NUM OBS	MIN	M A X I M A 24 - HOUR			ARITH MEAN	#>150	AM>50	% >MDV
					1ST MM/DD	2ND MM/DD	3RD MM/DD				
Bismarck Residential	2003	OCT-DEC	15	5.0	34.0 10/06	33.0 10/24	23.0 10/21	14.2			100.0
Fargo NW	2003	OCT-DEC	30	5.0	60.0 10/06	51.0 10/09	39.0 10/03	18.4			100.0
TRNP - NU	2003	OCT-DEC	15	2.0	19.0 10/24	13.0 10/06	11.0 12/11	7.6			93.3

The maximum 24-hour concentration is 60.0 µg/m³ at Fargo NW on 10/06

* The STATE and FEDERAL air quality standards are:

- 1) 150 µg/m³ maximum averaged over a 24-hour period with no more than one expected exceedance per year.
- 2) 50 g/m³ expected annual arithmetic mean.

SECTION THREE

EXCEEDANCE LISTINGS

By Site Date Hour

All Units Are in Parts Per Billion Except Wind Direction (Degrees),
Wind Speed (MPH), CO (PPM), and PM_{2.5} and PM₁₀ (µg/m³)

The * Identifies the Exceedances

NONE

By Date Hour Site

All Units Are in Parts Per Billion Except Wind Direction (Degrees),
Wind Speed (MPH), CO (PPM), and PM_{2.5} and PM₁₀ (µg/m³)

The * Identifies the Exceedances

NONE

